MACLEAN'S
ILLUSTRATIONS OF TEETHING.

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To Dr Smith
with the Authors Compliments

A

TREATISE

ON THE

PROGRESS AND SHEDDING

OF THE

HUMAN TEETH, &c.

WITH

Illustrations.

LONDON:
PRINTED BY JAMES MOYES, CASTLE STREET,
LEICESTER SQUARE.

37326

A

TREATISE

ON THE

PROGRESS AND SHEDDING

OF THE

HUMAN TEETH,

TO THEIR COMPLETION IN A PERMANENT STATE:

ON

THE MOST PREVALENT CAUSES OF THEIR IRREGULARITY AND DECAY; AND ON THE MEANS MOST APPROPRIATE TO THEIR PRESERVATION.

TO WHICH ARE ADDED,

Several Illustrative Plates,

AND

COPIOUS EXPLANATORY NOTES.

By R. MACLEAN, Dentist.

LONDON:

PRINTED FOR

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M.DCCC.XXXVI.

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TO

JOHN PATERSON CLARK, Esq.,

WHOSE KNOWLEDGE OF THE NATURE AND TREATMENT OF THE DISEASES OF THE TEETH HAS MAINLY CONTRIBUTED TO THE PRESENT IMPROVED STATE OF THE ART,

THIS LITTLE TREATISE

IS DEDICATED BY

THE AUTHOR.

ADVERTISEMENT.

The following Treatise is addressed to Parents and Guardians of Youth, with the view of impressing them with the importance of directing strict attention to the Teeth in Childhood; and of shewing that, upon the management of the First Set of Teeth, and of the Permanent Teeth during their evolution, the comfort and health, throughout life, of their offspring, and of those committed to their charge, very materially depend. The Author's endeavour has been to simplify acknowledged principles, and to apply them to practice in a way which his experience has proved to be most beneficial, and at the same time most in accordance with the operations of Nature.

53 Frith Street, Soho, London,
22d July, 1836.

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INTRODUCTORY OBSERVATIONS.

No branch of anatomical or physical science seems to be less perfectly understood, or more subjected to the influence of error, than that which relates to the structure of the human teeth,—to their various diseases, and to the mode of management best calculated to preserve them in a healthy and serviceable condition. It is a fact, much to be regretted, that the practice generally adopted at the present day, is one utterly at variance with the laws which Nature observes with respect to this part of the economy; and serves to perpetuate and multiply those disorders and irregularities to which it vainly proffers the application of a remedy.

This reflection becomes the more painful when we consider the extreme importance of the teeth, as essentially component parts of that beautiful machine—the human body,—and the intimate connexion that exists between their perfection and the regular and due per-

formance of those functions on which the general health of the frame very materially depends.

It will hardly be questioned, that no portion of the animal economy is of much greater ultimate importance than the teeth. The process of mastication can never be adequately performed, unless these, its instruments, are perfect in structure, and complete in number. The gifts of Nature are never superfluous; and more teeth have not been bestowed upon us, than are necessary perfectly to fulfil the important functions required of them. On the due performance of mastication, or, in other words, on the complete trituration and division of the food, and on the intimate admixture of it with the saliva before it is conveyed into the stomach, the healthy state of the digestive organs, and with them that of the whole body, most intimately depends; for, if the food descend to the stomach insufficiently triturated, and imperfectly divided into a mass of a pulpy consistence, that organ, stimulated to over exertion, soon becomes exhausted, imperfectly performs its function, and, in the end, becomes permanently deranged: the frame is thus deprived of its requisite portion of nutriment, and hence arise many of the diseases that afflict the human constitution.

To preserve the teeth in such a condition as will enable them to resist the ordinary operations of *wear and tear*, the effects of which are so manifestly displayed in the lapse of years on other parts of the body, Nature has, in their formation, beautifully adapted them for a permanent discharge of their important functions. For this purpose, they are composed of the least destructible material to be found throughout the human frame, or in organised bodies. Indeed, so little susceptible are they, in a perfect state, of decay, that not only in the sepulchres of more modern days, but even in the tumuli that are scattered over our downs, and that form almost the sole remaining link between the present generation and the aboriginal race of these islands, the teeth have been found entire and sound, whilst the bones with which they were inhumed, perhaps more than two thousand years since, have crumbled into dust.* This wise provision of Nature, in ren-

* The author possesses a human jaw having reference to the above period, which was taken, in 1834, from one of those tumuli so numerous in the county of Dorset. This jaw contains the entire set of teeth in the highest state of preservation, and indicating, from the reduction of their grinding surfaces, that the individual must have lived to a great age: yet, without the loss of a single tooth, or the least appear-

dering these useful instruments indestructible by the operation of any thing but of a violent nature, is clearly ordained with the beneficent intention that all should retain and enjoy the use of them to the end of existence.

Much has been said, and a great deal too much stress has been laid, upon our artificial state of existence

ance of decay, which is so general in teeth at the present day. To account for this, the contents of the stomach of this individual were also discovered, without having undergone decomposition; two thirds of which are composed of the seed of fruit, constituting at the time, possibly, the principal food of the tribe. This is an interesting illustration of an indisputable truth, that the more we depart from simplicity, the more we become the victims of diseases unknown at primitive periods. The author submitted these seeds, which were very numerous, to the inspection of Professor Lindley, in order to ascertain the nature of the fruit to which they belonged, and which he found to be those of the raspberry (*Rubus idæus*), indigenous, no doubt, at that period, in that part of the country; but of which, in a wild state, there is now no trace to be discovered.

"The workmen employed in digging a foundation for the pedestal of the statue of Charles II. have turned up a good many human bones; amongst which was a part of a jaw-bone with several teeth in it, perfectly white, and untouched by time, although two hundred years, at least, must have passed by since they were buried."—*Edinburgh Observer.*

as being productive of the maladies that affect the human teeth. That these diseases have sometimes been occasioned, and frequently increased, by an abuse of the gifts of Providence, it would be folly to deny; and it is universally admitted that the more we depart from simplicity, so much the more we become victims to disease and its consequences. In almost every instance, even where the primary cause may here be found, the progress of disorder may be attributed, as to a proximate or more immediate cause, to carelessness and want of proper management. It is little less than fallacy to look to this "artificial state of existence," as the so fertile and irresistible cause of disease, when there exist such simple and easily adopted means of counteracting its effects. Man was designed to be the lord of the creation. All things were given to him for his use; and if he enjoy those gifts in moderation, avoiding all extremes, he will not have much to fear from the effects of the "artificial state of existence," upon the teeth.*

* "In the teeth of all animals in a state of nature, we discover no diseased structure or deformity, and, therefore, we must ascribe it in the human subject to fortuitous, not constitutional or hereditary causes; for that they are less destructible than any other part of the frame, is

If we inquire, we shall find that mankind were not intended to form an exception, in suffering, to the rest of created beings; otherwise, original malformation might account for it; but, instead of which, the same perfection reigns throughout. Is it not humiliating to think, that the endowment bestowed on the brute by instinct, should supersede, or even surpass, the gift of reason bestowed on man? This shews that the powers of reason are not properly exerted: hence the penalty.*

Although the utility of the teeth in comminuting the food, and in preparing it to be duly mixed with the saliva, and acted upon by the gastric juice, is undoubtedly great, and although it is, on this account, highly desirable that they should be preserved in a sound and regular state, yet, this is not the only inducement to their preservation. In a somewhat subordinate point of view, but one, nevertheless, on

evident, since, in places where bodies have lain for centuries, teeth are found entire and sound, while the other bones crumble to dust."—PARMLY.

* "According to the soundest view which I am able to obtain of this natural law, pain and death in youth and middle age, in the human species, are consequences of departure from the Creator's laws."—COMBE.

which great attention should be bestowed—namely, the attainment of a pleasing exterior,—the teeth are interesting parts of the human economy. When the comparatively forbidding appearance given to the countenance by an irregular, distorted, and incomplete set of teeth, is considered, with the collateral, but not unimportant inconvenience of imperfect articulation; and when these are contrasted with the beautiful and symmetrical appearance of the healthy and regular state of these organs, and the consequent distinctness of the articulation, it must be conceded, that they are entitled to the strictest attention that can be directed to their preservation and perfection.

Notwithstanding the bountiful intentions of Nature with respect to the permanence, utility, and the beauty of the human teeth, and her admirable adaptation of them to their purposes, it is lamentable to observe that, through the prevalence of an erroneous practice, the beautiful mechanism she has provided, and the philosophical adaptation of it to the purposes of the human being, have been most injuriously interfered with; and this interference has given rise, not only to inconvenience, but to premature suffering, and to numerous diseases. These consequences, the importance of which

will be conceded by the more experienced members of the medical profession, sufficiently indicate the propriety of having recourse to juster principles and surer guides, in the regulation and preservation of organs so necessary as they are to the economy, and which perform the first and not the least important part in the functions of digestion and assimilation.

It is gratifying to find that the means used by Mr. Paterson Clark and by the author, for many years, for preventing disease and decay of the teeth, are now not only adopted but inculcated by those, who are esteemed authorities in the profession, and by those, whose learning and experience are justly considered great.* Since gangrene or caries of the teeth may be considered as analogous to cancer or any other malignant disease of the body, the means of prevention, as in the latter, must be resorted to, as affording the only reasonable hope of success, and should supersede more direct but often unavailing methods of cure. What cannot be remedied, should be extirpated before adjoining parts are contaminated; but extirpation ought

* See Dr. James Clark, Treatise on Consumption, &c.; and Dr. A. Combe, on Physiology, applied to the Preservation of Health.

not to be prematurely or unavailingly practised; or before measures of approved efficacy have been fully tried; or until the mischief has extended so far as to endanger other organs. The great success attending the preventive means inculcated in the following pages, is sufficiently established, and is admitted by all who are capable of judging respecting it. But, although thus obvious, it is not sufficiently attended to by those whom it chiefly concerns. If the use of means to prevent the commencement and extension of disease of the teeth be allowed to be requisite, it must necessarily follow, that the earlier such means are resorted to the better. Yet it is astonishing how many persons, otherwise alive to their interests, and to their happiness and comfort, defer having recourse to proper advice, and to the advantages proffered them, until the eleventh hour, or even until the time has passed away at which sufficient aid can be administered. Till the teeth become troublesome, nay, even tormenting, many think them absolutely undeserving the least attention. The dentist is then required to perform impossibilities, and, unfortunately, the performance of impossibilities are too often promised, and the interests of the art thereby compromised. Nothing can be more repugnant to common sense, than the conduct too

often pursued in such cases; and nothing can be more unreasonable, than to hope for permanent benefit in such circumstances.

The extent to which these errors have prevailed, shews that the means of public guidance in these circumstances is still a desideratum; and, in the hope of supplying it, the author ventures—however humble his effort may be—to place before the community the following illustrations. Conformably with his views and with his experience, he will endeavour to prove, that the principal evils incident to the human teeth (accidents excepted), arise from premature or misdirected interference with the temporary teeth, and from neglect of cleanliness. Inattention to the changes connected with the absorption of the first set, to the periods at which it takes place, and to the various sympathies brought into play at this time of life, has led to the most injurious effects, not merely in respect to the permanent set, but also as regards the general health.

For the purpose of illustrating his views, and rendering them intelligible and serviceable to those who are interested in the welfare of children and young persons, the author commences with an account of the progress of the human teeth in cutting the gums,

together with the period of shedding them, until the permanent set is completed. Parents and guardians will thus be made familiar with a subject, which concerns them and those committed to their care much more intimately than is too generally conceived.

This little work is illustrated by ten plates (taken from nature), shewing the growth and shedding of the primary teeth, and the progress of the permanent set. By reference to these, and with the aid of the accompanying explanations and observations, parents will be enabled to direct the processes of dentition from infancy to manhood. Being, also, thereby enabled easily to judge for themselves, they will be the better able to discern when the interference of art should be interposed, as well as to prevent improper treatment at the hands of others. Nature seldom errs. When, however, we overlook her dictates, can we be surprised that we suffer the consequences of the neglect? In no instance, nor in any circumstances, is nicer discrimination more required than in the prevention and management of the disorders of the teeth. Much of comfort and of health, in after life, depends upon the manner in which these objects are attended to in childhood; for it is at this period of human existence that the developement of the jaws, and the regularity and

the beauty, and, above all, the permanent health and duration of the teeth can be efficiently promoted. Great and manifold are the evils which result from improper interference, and from neglect, at this period. Removal of the temporary teeth before the due time, however carious they may be, is generally attended by the most injurious results. It prevents the requisite developement of the jaws, and thereby gives rise not only to a crowded and an irregular state of the permanent set, but also, as a consequence of this, to premature decay and to disease. Having ascertained the cause of mischief, the remedy will be more appropriately applied; but a still more important good results, — the means of prevention is thereby offered us, and placed easily within our reach.

Guided by the above views, the endeavours of the author have been to simplify principles, to reduce them to practice, in accordance with the laws of Nature, and to render them available to the wants of the public. Conformably with this end, he has made his precepts so accessible to all, as to render them generally useful. Should he be found to have added a mite, however small, to the alleviation of "the thousand ills that flesh is heir to," his labours will be fully compensated.

ILLUSTRATIONS

OF THE

PROGRESS AND SHEDDING

OF THE

HUMAN TEETH.

CHAPTER I.

THE FORM OF THE JAWS IN INFANCY AND IN ADULT LIFE.—THE PROGRESS OF THE TEMPORARY TEETH.—THE ORDER IN WHICH THESE ARE SHED, AND SUCCEEDED BY THE PERMANENT TEETH.

In a work of this kind, which is intended rather as a practical guide for those who are intrusted with the care of children, than as a scientific dissertation, it is not necessary to enter into any precise anatomical description of the structure of the teeth and their appendages. It is intended, therefore, to proceed at once to point out the difference in the form of the

jaws in infancy and in after life; as one of the most mistaken of the prevailing notions connected with the diseases of the teeth proceeds from an erroneous estimate of this variation.

Nothing can be more conspicuously beautiful, when duly considered, nor can any thing be more wisely adapted, than the provisions of Nature in this respect. At the period of infancy, after the completion of the temporary teeth, which are invariably regular, each jaw forms nearly a semicircle, until about the age of seven years, when the first four permanent molar teeth, or grinders, make their appearance; after which the jaws begin to assume the elongated section of an ellipsis. A strange infatuation prevails amongst parents and guardians, in encouraging youth to injure and loosen the temporary teeth by means of strings, &c., under the erroneous impression that, as soon as a space is made by the removal of the primary tooth, the succeeding one has no impediment to its progress through the gum. Before the process of absorption of the old tooth is completed, this is equivalent to its premature removal by instruments; and persons who thus encourage it are little aware of the misery entailed in future life, by thus causing contraction of the jaws, and, consequently, *irregularity of the teeth*, from which I have every

reason to believe *two-thirds* of the cases of decay incident to the human teeth arise.*

The notions entertained by many persons that the whole of the permanent teeth come directly under and push out the temporary teeth, and that the extraction of the latter is desirable, in order to give room, as they imagine, for the former to grow and make their

* The various sympathetic disorders described in the following passage from Dr. Copland's *Dictionary of Practical Medicine*, as occurring particularly in persons whose maxillæ are insufficiently developed, depend, frequently, in the first instance, upon the premature interference with the primary teeth. Imperfect developement of the jaws will necessarily arise from early extraction of the temporary teeth; and thus, by causing the delay in the appearance of the permanent set, cause the various sympathetic affections in delicate and irritable subjects. "The *irruption* of the *second*, or permanent, teeth, may also be delayed or attended by sympathetic disorders, particularly in persons whose *maxillæ* are insufficiently developed, and when the *dentes sapientes* and the canine teeth are appearing. In delicate, nervous, and irritable subjects, swellings of the parotid and sub-maxillary glands, painful and sometimes periodic affections of the ear or face, slight or recurring ophthalmia, irregular convulsions, or epilepsy, and chorea, have, in some instances, been excited by this cause; and have disappeared upon the eruption of the teeth, or the removal of the local irritation."—See *Dictionary of Practical Medicine, &c.* by James Copland, M.D. F.R.S. *Article* on Difficult Dentition. These frequent effects of undue interference ought to be additional inducements for parents cautiously to avoid it.

appearance, are not only utterly fallacious, but eminently calculated, as will hereafter be shewn, to prevent the attainment of the object sought for, and to frustrate the wise provisions of Nature. With regard to the whole of the incisors, or front teeth, including the canine, or eye-teeth, the fact is, that the permanent, which are double the size of the temporary, teeth, are actually formed within the arc described by the latter not becoming fully formed until the whole of the fangs of the temporary teeth have been destroyed by absorption; or, as the process of absorption operates on these, the growth or maturity of the permanent teeth proceeds in an equal ratio. Hence, we see of what essential importance it is, not to induce the contraction of the jaw in childhood, by removing any of the teeth, until its successor is ready to occupy its place; and when this period arrives, Nature provides amply for the event, without requiring the intervention of any artificial proceedings.*

* "It may be remarked, that lateral pressure, so sure a source of decay, is often induced by mismanagement; and, perhaps, it may be added, that this observation applies more to those classes of society for whom too much, rather than too little, has been attempted by the dentist, as irregularities are, from premature extraction of the shedding teeth, more frequently met with in high than in humble life."—J. P. Clark.

Heads of families and practitioners will, therefore, do well to avoid the prejudicial influence of any premature interference in the shedding or removal of the temporary teeth. The extraction of one of these before the process of absorption has been fully completed in its fang, or unless its successor be actually in sight, must necessarily, by occasioning a vacancy, operate in effecting a contraction of the jaw to a greater or less extent; and the extent of this contraction will be various, according to the duration of the vacancy previous to the appearance of the permanent, in the stead of the primary tooth. Should the external part of the tooth—that portion of it which appears above the gum—be ever so much decayed, and should it be attended with toothach, as it frequently is, but which is of a temporary nature, and easily relieved, there is no reason, on that account, for its removal. The decay can have no effect upon the existing fang, which must remain to undergo destruction from the natural agency of absorption; and, when this is completed, the permanent tooth, which, whilst enveloped in its alveolum, has probably drawn some portion of its pabulum, or nourishment, from this source, is found ready to succeed. It is incumbent on parents and guardians of youth, to pay strict attention in observing the periods at which the teeth make their appearance. This is an

important point, as the appearance of the teeth differs occasionally, to the extent of many months. In some children, they are visible as early as four or five months after birth, whilst in others, their appearance is delayed until the age of fifteen or even eighteen months. As the time of shedding varies according to the difference of the first appearance of the temporary teeth, and as, consequently, the case of one child is not to be treated in the same manner as that of another at the same age, a knowledge of the period of appearance is very necessary for the guidance of the parent or practitioner, in order to avoid premature interference, the lamentable effects of which, the author trusts, will be evident to every one, on a perusal of the following chapters of this little Treatise.

In this place, it will only be necessary further to point out the order in which the teeth appear and are shed. The temporary teeth are twenty in number, ten in each jaw. They come nearly in pairs, those in the under generally preceding those in the upper jaw. The order of their appearance in each jaw is as follows: The first that are observed are the two central incisors; the next, the two lateral incisors; then the two first molar teeth, or grinders, followed by the two canine, or eye-teeth; and, lastly, the two second molar teeth. All these are generally completed by the time the child

arrives at the age of three years; and this full complement of temporary teeth should be enjoyed without loss until the child arrives at the age of from six to seven years; at which period the first permanent molar teeth make their appearance, as an indication of the change about to take place; and these ought to be completed in both the upper and lower jaws just at the time the shedding of the temporary teeth is about to commence.* Too much stress cannot be laid upon the importance of this period of life. The change that

* "Soon after the completion of the first set, spaces begin to appear between them, which, in favourable circumstances, continue to enlarge until the succession of the second teeth.

"This is sometimes a source of unreasonable anxiety to parents; without reflecting on the changes necessarily taking place at an early age, they expect the mouth of a child to continue always equally beautiful, and, hence, his first fertile source of torture.

"The most striking change in structure of the jaws takes place at both their extremities, when four new permanent teeth make their appearance at six years of age, and in situations formed expressly for their reception, since the completion of the first teeth. They are placed the last tooth in each side of the upper and lower jaws,—the sixth tooth every where from the centre of the mouth. All the additional teeth of the second set, without any reference to those that change, make their appearance four at a time, in the same manner, at intervals of six years; thus distinctly indicating periods that may be reckoned as natural eras in teething."—J. P. Clark.

takes place in the teeth should be progressive, and effected by the temporary teeth dropping out (*not being extracted*) in pairs, in the order in which they appeared, as shewn in the accompanying illustrations, indicating the change generally, making allowance, of course, for the variation in different individuals of a few months.

Nothing more strikingly marks the design entertained by nature for the preservation of the temporary teeth during the process of shedding, and the wise provision she has made for this purpose, than the very early appearance of the first four permanent molares, or grinders, before the process of shedding the temporary teeth commences. Anticipating the weakness of the temporary teeth during the process of absorption, especially when it approaches to completion, and providing against interruption of this process, and of the healthy growth of the permanent set, Providence has most wisely ordained that four of the permanent molares, or grinders, should be so far developed, as to prevent these contingencies—as to ward off the friction that would otherwise injure the temporary teeth during the process of their removal, and, consequently, disorder the permanent set during their formation. Does not this fully demonstrate the propriety of non-inter-

ference with the laws which Nature has so beneficently provided for the completion of her purposes in respect to this part of the human economy?*

* "In perfectly organised mouths, the front teeth, although they touch front teeth in the other jaw, never press severely against them. You could at any time draw a slip of paper away without tearing, however much a person wished to retain it This you must see, is owing to the manner in which the jaws are propped by the meeting of the flat, grinding surfaces of double teeth. This, then, is the reason why these permanent molares come into the mouth at so early an age. The shedding grinders are generally in a condition to sustain the pressure of the jaws until the "six year old" can attain their proper station above the gums."—J. P. Clark.

CHAPTER II.

INVARIABLE REGULARITY OF THE TEMPORARY TEETH.—IRREGULARITY AND DECAY IN THE PERMANENT SET, ORIGINATING IN MALPRACTICE, AND NOT IN MALFORMATION.—BEST MODE OF OBVIATING THE CONSEQUENCES OF SUCH IRREGULARITY, AND OF PRESERVING THE TEETH WHEN SO AFFECTED.

HAVING now examined the successive appearances and progress of the teeth, our subject brings us to a consideration of that irregularity and its consequent disease, which are, unfortunately, so manifestly prevalent amongst the adult population. Nothing is more evidently beautiful than the provisions of Nature for regulating the temporary teeth. They are invariably perfect and regular: and analogy would lead us to infer that the permanent teeth ought to be equally regular and useful; if, indeed, they ought not to be still more so, considering the important functions they have to perform, and the circumstance of their office being intended to last through life. Yet what is more frequent than to observe states quite the reverse of the above—to observe confusion where complete order should prevail; irregularity where regularity should exist; and disease in the place

of soundness? This cannot be supposed to arise from defective organisation, for the effect of such a cause would be equally evident, if not more so, in the first teeth. The only adequate source to which it can be ascribed, is that fertile one of malpractice and mismanagement, the extensive and painful results of which will be shewn hereafter.

From his experience acquired during a pretty long course of practice, the author feels himself justified in affirming that, two-thirds of the cases of decay incident to the human teeth arise from lateral pres sure, occasioned by premature extraction of the temporary teeth, by which the due expansion of the jaws is prevented, the teeth thereby becoming crowded and irregular, and pain and decay arising as the consequence of the pressure.*

* This pressure unfortunately occurs before the teeth are sufficiently matured; and hence the points of contact and pressure are easily affected, and readily become the seats of decay. These results will sometimes take place even in apparently well-formed jaws and in regularly set teeth. How great, therefore, must be the evil produced in jaws and teeth which are imperfectly developed and irregular? These facts evince the necessity of having early recourse to means for preventing the mischief; because years pass on subsequently to the commencement of contact, or pressure, before the patient is aware that there is any thing the matter; and when the evil becomes manifest, it is thought to be of recent date.

The whole of the teeth are more or less liable to be affected with decay, in consequence of this lateral pressure; but it operates with peculiar frequency and violence on the incisors, canine, and small molar teeth; and is more prevalent from this source in those of the upper than of the lower jaw. This circumstance affords additional evidence, that the caries does not invariably arise, in the former situation, from another fertile source of dental affections, viz. the deposition of extraneous or morbid matters, forming tartar.

On the other hand, if the first teeth, the period of shedding of which takes place from six to twelve or thirteen years of age, are permitted to complete their changes without the intervention of erroneous and most injurious practices,—if they are allowed to become more and more loose as the process of absorption proceeds, and to drop out naturally, when the fang has been totally destroyed by the completion of that process,*

* What becomes of the largest portion of the tooth composing the fangs after the process of absorption? How far is not the material of the old tooth thus absorbed, required for the full developement and completion of the new one? In this way, too, by arresting the process of absorption, the maturity of the permanent tooth may be materially diminished. I have scarcely seen a case in which the process of absorption was not fully completed before the appearance of the permanent tooth, its successor.

the pleasing consequence will ensue, that the jaws will preserve their due expansion, and, as the temporary teeth fall out, the permanent teeth will be ready to occupy their places. Thus, with very few exceptions, regularity will be attained; and by the absence of that crowded state of the teeth which results from a contracted jaw, decay, which so frequently arises from lateral pressure, will be prevented.

This is not a matter of mere theoretical assumption, but is verified by every day's experience. If inquiry be made of the few individuals nearly approaching to, or arrived at, old age, who have happily been exempt from suffering by loss or decay of the teeth, it will be found in all instances, without exception, that their jaws and teeth are regular. Their habits, in a few instances, may have been by no means conducive to the health of these organs, but it will invariably be found that their teeth are regular, and that this regularity depends upon their never having experienced in their management, the interference of any other principles than those which are suggested by a careful observation of the phenomena of nature.

Supposing, however, irregularity to prevail, and decay to have followed as a matter of course, yet, by early attention, by careful examination, and prompt adoption of the proper measures, nothing is more

simple and easy than to arrest the progress of that decay. This is a matter, too, of the utmost necessity, for caries in the teeth is so like to cancer in any other part of the body, that, if it be not completely eradicated, its destructive operation will not cease until it has destroyed the whole fabric of the tooth. The mode of effecting this arrest, is similar to that practised in the removal of malignant disease in any other external part of the body—by mechanical means, viz. cutting, filing, &c.;* and thus, by the same

* "All the teeth, single and double, are liable to disease from lateral pressure. Its approach is perceptible to the practised eye, in most cases, for years before the patient can know any thing of the matter. If these symptoms be perceived at an early stage of their decay, before decomposition has entered deeply into the substance of the teeth, the remedy is extremely simple. It consists in filing or cutting open a clear space between two teeth. This is precisely the stage in managing teeth, at which the dentist usually experiences the greatest obstructions from his patients or their guardians. The everlastingly repeated interrogatories of—does not filing destroy the enamel? do not the teeth always decay after this operation? are showered upon his ears in so many forms, and with a perseverance so determined (together with the resistance, perhaps, on account of pain, of the parties most concerned), as almost to deter him from this, the most valuable of operations; or he is compelled to stop short half way. Many instances of failure are to be met with, but which, if fairly traced, would, in most cases, be found to be owing to the obstructions thrown in the way of the operator. Yet, successful cases are

process, the cause—lateral pressure, and the existing consequence—decay, will be both removed. By these

frequently to be met with, of twenty, thirty,—yes, even of forty years' standing.

"In order to be successful, the operation must be performed well. Let it not be lost sight of, that the lateral surface of a tooth never can decay, if kept perfectly clean and polished. Considerable skill, founded on experience, is required on the part of the operator, and determined resolution on the part of the patient. If the decay be between two front teeth, care ought to be taken not to injure their appearance. By cutting open at an early stage, with a very thin file, a space to admit the free play of a piece of tape (or edge of a napkin), enough shall have been done for safety, if the space be kept daily clean by the use of it; but if the disease has penetrated too far into the teeth to be removed by the thin file, the posterior sides of the holes may be cut away slantingly inside the mouth, always leaving such a surface as can be rubbed in every part of it equally by the piece of tape, &c. The tooth-brush also may be successfully employed inside the mouth, to aid in the operation of cleaning. The operator may with safety approach to very nearly the seat of the nerve itself in the centre of the tooth, should the case require his so doing. The tenderness occasioned by the operation will soon wear off, or it may speedily be cured by the use of anodynes—should the caries have proceeded so far into the substance of the tooth as to render it impossible to have it quite obliterated by rasping, the remaining hole must be cleaned out and plombed in the usual way with gold or tin.

"In cutting between diseased back teeth, one need not be very particular; for the larger the space is, so much the better for the case—cutting out is always preferable to stopping with metals, when it can be effected."—J. P. Clark.

means, and, subsequently, by keeping up the separation, and by preserving the surface clean by the frequent use of a fold of a napkin passed between the teeth, together with the friction of the brush, the progress of the decay may be completely arrested.

There are many persons who urge objections to this mode of treatment, not from any anticipation of pain, but from imagining that, by reducing the enamel as well as part of the vascular body of the tooth, the cure would be worse than the disease. If, indeed, this be an evil, how trifling is it when contrasted with the certain and gradual progress of decay, rendering the teeth unserviceable as regards the important purposes for which they were intended, and subjecting the individual to the unhealthy effects resulting from their caries and loss—to the deterioration of personal appearance, and its frequently vexatious consequences; and, if they be not lost, probably to the frequent annoyance of that distressing pain, the toothach; and to the many other inconveniences springing from the same cause.

It is to be hoped that time, with the aid of reason, analogy, and facts, will eventually do away with much existing prejudice on this subject, and that the mode of treatment just alluded to, when necessary,

will supersede the usual insecure and unsightly practice of stopping, as at present adopted in cases of lateral decay. It is confidently affirmed, that in the happy event of the general application of this principle, not one tooth would be lost, for many thousands that are now got rid of from the neglect of such treatment at the outset.

CHAPTER III.

ERRORS OF INDISCRIMINATE EXTRACTION FURTHER SHEWN. — ITS CONSEQUENCES SOMETIMES RENDER THE SUPPLY OF ARTIFICIAL TEETH ESSENTIALLY REQUISITE.—OTHER CAUSES OF DECAY THAN THAT OF LATERAL PRESSURE, POINTED OUT.

When the consequences of indiscriminate and premature extraction are further stated, it is hoped that few persons will continue to countenance a practice so productive of mischief, and so repugnant to reason and experience. The arrangement of the teeth, and the variations in their periods of appearance and change, serve, in most instances, to augment the evils that proceed from extraction. If a vacancy caused by the premature extraction of a single tooth remain for any length of time unfilled by its successor, the jaw necessarily contracts gradually, and the adjoining teeth approach each other in a greater or less ratio, in proportion to the lapse of time. If this consequence result from the loss of one tooth, how fearfully is the evil augmented when, as has frequently been the case, without regard to consequences, or periods of their appearance, teeth have been extracted to the number

of six, eight, and even ten, at one sitting! Since we see that the wise provisions and intentions of Nature are thus subverted, should any wonder be expressed that there exist so much deformity and suffering?

"It were well if the intentions of Nature were more attended to in the regulation of the teeth, than has generally been the case. In this, as in every other circumstance in which surgical treatment is required, it should be recollected, that the legitimate object of the surgeon is confined to the application of remedies in disease, or the regulation of the natural functions when they are deranged; and it is not to be supposed that a process of so much consequence to the comfort and health, and essentially connected with a function so important as that of digestion, should be so imperfectly provided for as to be constantly in need of such harsh and unnatural interference. I have known no less than eight, and even ten, firm teeth forcibly removed from the jaws of a child at once! I will not employ the terms of indignation and disgust which such barbarous quackery deserves; but, surely, the unnecessary infliction of pain, upon the plea of preventing an evil, which, in the majority of instances, there is not the slightest reason to apprehend, and which, even where it might occur, can always be

detected in time to obviate it, is of sufficient importance to deserve reprobation, even were this the only injury which could result from the treatment. But there are other and more important reasons for avoiding the early removal of the deciduous teeth. It will be remembered, that the connexion between the temporary tooth and the succeeding permanent one, continues to exist, by means of the cord extending from the suck of the latter to the neck of the former, which must be torn through, if the temporary tooth be removed before the sack is absorbed: until, therefore, the secretion of the enamel is perfected, which is not the case until a short time before the edge of the tooth passes through the gum, the extraction of the temporary tooth may very probably interfere with the healthy and uniform deposition of this substance.

"There is yet another evil resulting from this empirical mode of treatment, which has hitherto been unaccountably overlooked, but which should be impressed on the mind of every practitioner to whom the care of the second dentition is intrusted. The temporary teeth, as long as they remain in the sockets, from being arranged in a continuous and even series around the arch of the jaw, tend to preserve its form and prevent its contracting during the growth of the

child, when every part of the body is undergoing continual alteration, in form as well as in size.

"By the time that the teeth have become loosened, the permanent ones, in the natural course of the change, are ready to fall into their place, and, thus, the correct form of the jaw is preserved; but, if the temporary teeth be removed before the permanent ones are so far advanced as to be ready to occupy their situation, the support of the alveolar processes being thus lost, the arch of the jaw contracts; and when, subsequently, the permanent teeth are fully formed, there is not room for them to range in their proper situation. Thus the operation, which was intended to prevent irregularity, becomes the cause of its occurrence, and that in its very worst form, producing a want of accordance between the size of the teeth and that of the jaw.

"I have seen so many instances in which this result has taken place, that I have perfect confidence in stating the opinion. The case I am about to mention, in which I had an opportunity of tracing all the circumstances which I have just described, will serve as an illustration.

"A fine healthy boy, about seven years of age, whose maxillary arch was ample and well formed, with every

appearance of sufficient room for the permanent teeth, was taken to a dentist to have his mouth examined. This person, without a moment's hesitation, and without informing the patient of his intention, placed the child's head under his arm, and instantly removed, with great dexterity, eight teeth, all of which were firm; nor was there any appearance of an irregular arrangement in the approach of the permanent ones.

"It was, indeed, some months before any of the latter made their appearance, by which time the remaining temporary ones on each side had approached each other, and contracted the space between them. The consequence was, that the teeth were, ultimately, so irregular, from want of room, as to require the loss of four of the permanent ones, namely, the first, or *Bicuspides*, on each side, both in the upper and lower jaw, to allow of their acquiring their proper and regular situation.

"It is to be remarked, that the other children of the same family, and they all greatly resembled each other, were not subjected to similar treatment, but nature was suffered to proceed in her own way, with very little assistance; and in no one of them is there the slightest irregularity."*

* T. Bell.

The most prevalent mistake, with regard to premature extraction, is made in reference to the canine, or eye-teeth; and this is the more to be regretted, since they are the teeth on which the beauty and strength of the circle mainly depend. Like the key-stone of an arch, they are the chief support of the structure, and are essential to the symmetry and durability of the whole set. Besides, the canine are almost the last teeth in undergoing the process of shedding; yet, instead of being guided by this rule of nature, the almost universal practice, hitherto, has been to extract them next in order to the incisor teeth, to which they are most nearly placed. Thus they are frequently removed from the jaws as much as two or three years before the natural period of shedding them. The spaces occasioned by their extraction are, during such a long period, so filled up by the adjoining teeth approximating each other, and by the contraction of the jaws, that when the permanent canine teeth make their appearance, they must shift either to the outer or inner side of the contracted jaw, thus becoming entirely useless, assuming a tusk-like and unnatural appearance, making the jaw angular rather than circular, and, by inducing a crowded state of the teeth, becoming a fertile source of future decay. The cause

of this frequent deformity, and of its consequences, being thus pointed out, the mode of easily avoiding it, by strictly adhering to nature, reason, and analogy, is evident.

The evil consequences of extraction of the permanent teeth, are almost equally great, especially as respects the production of irregularity, to those which follow the loss of the temporary teeth. If persons were adequately sensible of the nature and extent of these consequences, they would consult reason, and patiently submit to the judicious application of physical means, rather than permit the extraction of a tooth that can never be restored: they would undergo a lesser, rather than a greater evil; for extraction can be viewed only as a greater evil, even admitting that the operation were ever so easily and skilfully performed.* But, with reference to extraction, there is this difference between the jaw of the adult and that of the child:—in the

* "The extraction of teeth is an operation which cannot fail justly to create some alarm, when the circumstances attending it are considered. We know that in the hands of the most dexterous operators it has sometimes been attended with serious, nay, even fatal consequences; and, therefore, it should be avoided whenever in our power, instead of being adopted, as too often happens, in the first instance.

"There is, perhaps, a greater share of manual dexterity necessary in

latter, if a temporary tooth is prematurely extracted, the jaws contract, and the teeth approach each other in parallel lines; but in the adult, the expansion of the jaw is not affected; but the remaining teeth subsequently approach each other in a slanting direction, losing that perpendicular position on which their chief strength, and their action in the important function of mastication, so greatly depend; and as the fangs and sockets remain immovable in their original situation, the grinding surfaces afterwards assume the direction of so many inclined planes, and present mere angular points, instead of flat surfaces, for all dental purposes. Indeed, the teeth immediately adjoining the space which the extracted tooth filled, sometimes incline so greatly (followed, in a gradually diminishing degree, by all the teeth on either side), as to prove entirely useless, from not meeting with their opposing teeth in the other jaw. Supposing one or more of the teeth

performing it than is generally imagined, to prevent fracturing that portion of the socket where the fangs are situated; and if the alveolar process is uncommonly firm, and does not yield to the force of the instrument directed against it, the fracture will extend a considerable way into the jaw, and the effects of it may injure the patient for life. The operation is sometimes also followed by a most dangerous hæmorrhage, which, in many cases, has defied every effort of the most experienced surgeons."—PARMLY.

of the lower jaw to have been extracted, the teeth in the upper jaw remaining complete in number, the consequence will be that, as they are always prone to come into actual contact with their antagonists, the teeth corresponding to those extracted will gradually move from their sockets, until they meet the opposite gum; and, in this state, having lost the retentive support which they derived from their alveola or sockets, they must drop out. This gradual moving downwards or upwards, and loosening, are necessary consequences of the suspension of their functions; and these changes will affect all the teeth opposite to those that have had an inclined direction given them.

It is in a state that threatens this total disarrangement of the teeth, and the extreme distortion just pointed out—it is when extraction has been performed, whether improperly, or when rendered necessary by the disregard of the preservative means spoken of, that the supply of the vacancy by artificial teeth becomes absolutely necessary; and although this brief treatise, with its accompanying illustrations, is solely intended to point out the necessity and the easy means of preservation, yet, when neglect or accident has occasioned the loss of a tooth, the consequences of that loss, as shewn in distortion and imperfect mastication, can

only be obviated by supplying the vacant space with an artificial material, and thus giving to the remaining teeth that support which is requisite to retain them in their places.

A set of perfect and regular teeth may be compared to a well-built arch; and the consequences of interfering with the latter by taking a stone from it, afford an apt illustration of the perilous results attendant upon the extraction of a tooth. The arch retains its strength, its utility, and the symmetrical beauty of its proportions, as long as all its component parts remain perfect and consolidated; but, let one stone be removed, and the harmony and safety of the structure will be immediately destroyed; and, though the building itself may not at once crumble to fragments, none will maintain, that it will not be materially weakened; for, by the action of the customary applications of weight and friction, it must sink at last through a course of lingering though inevitable decadence. Like the stones of that arch, each tooth serves for the support of those adjoining it, and thus tends to consolidate the aggregate strength of the whole set; and the loss of an individual component portion of that set, is felt throughout the whole, in the commencement of irregularity, weakness, and diminished utility, which use and the friction

requisite for mastication, serve to increase, and ultimately to consummate.

Having thus pointed out the most productive cause of decay to consist in lateral pressure, it only remains for me, in this chapter, to refer to its other sources.

The enamel that covers the vascular body of the tooth is similar to a vitrification, having no yielding or elastic property, and is not easily expansible by the application of any extreme degree of heat, nor contractible by that of cold. In this respect it partakes very much of the quality of glass, or the vitrified surface of porcelain and other ware. Every one knows that from frequent use, the vitrified matter, with which tea-cups and other domestic utensils subject to great and sudden heat are covered, generally present, after long use, minute cracks extending in every direction; and nothing is more frequent than for glass to break from exposure to extreme heat, if not previously prepared by being subjected to its gradual increase.* The enamel

* "Teeth once formed, which happens while yet within the jaws, (with the exception of their fangs or roots), do not continue to grow afterwards, while the jaws that contain them do. Were it not so, one set of teeth would be sufficient; like other parts of the body they would enlarge, and seem at every period of life in keeping with the surrounding features of the countenance. But the nature of the thin

of the teeth is liable to be similarly affected; and the extremes of heat and cold are equally injurious, by causing cracks, that form so many receptacles for the deposition of moisture and extraneous matters, which become putrid, and operate with a decaying influence on the vascular body of the tooth to which they thus

enamel forbids this; like glass, it cannot be expanded without cracking. The teeth are, in fact, unlike any other part of the body, and in describing them, can only be compared with teeth. They form a system within a system; bones, with a part of them exposed to external influences, and part to internal ones only. Other bones may be broken, and they will heal again; they may be diseased, and recover by exfoliating the diseased part; but the teeth, once formed, are formed for ever. They never undergo any change but that of deterioration. Nature has not provided a renovating power for injuries of the teeth; they were doubtlessly intended to be as permanent as life (however long). The nails and hair are thrown off, and still there is a new supply of their substance. But with respect to the teeth, if the smallest flaw exists in their surface, if but the smallest chip be removed at any time, the deficiency remains unrepaired by nature for the remainder of life. Touch but a point of enamel with strong acid, and it remains a blemish for ever."—J. P. Clark.

"Another circumstance in which the teeth seem different from bone is, that they never change by age; and seem never to undergo any alteration, when completely formed, but by abrasion: they do not grow softer like other bones, as we find in some cases, where the whole earthy matter of the bones has been taken into the constitution."—Hunter.

gain access. These cracks, though at first exceedingly minute, gradually expand by pressure and constant friction; and, when the teeth come accidentally in contact with hard substances, they are not unfrequently the occasion of fractures, or at least they dispose the teeth to such injuries, as well as to painful affections after vicissitudes of temperature. To these cracks also may be attributed that peculiar sensation experienced after eating fruit containing much acid; or, indeed, after subjecting the teeth to the action of any acid. This sensation is commonly described by saying that the teeth are set on edge; and it is owing to the contraction of the enamel, and to the consequent exposure of the minute fissures, that it is most exquisitely produced. To this cause of decay may also be added, the indentations peculiar to the surface of some teeth, particularly the grinding surfaces of all the molar, and which afford spaces for the lodgement of injurious matters, which operate in the same way as the cracks. The tartar, also, which collects in these indentations, like a sponge absorbs and retains acids, &c., which very materially promote decay. The only mode of avoiding the evils caused by the above circumstances, is to pay particular attention to cleanliness; constantly to keep the grinding surface free

from any foreign depositions; to prevent the accumulation of any injurious matter by the frequent use of the tooth-brush; to remove any collection of tartar as soon as it forms; and to eradicate incipient caries by appropriate means.

It is not too much, perhaps, to ascribe to the circumstances favouring the deposit of moisture and other impurities, and thereby affording a nucleus for tartar, &c., almost every decay incident to the human teeth, which is not derived from lateral pressure.

CHAPTER IV.

REGULARITY OF THE TEETH ATTAINED, THE BEST MODE OF MANAGEMENT SUBSEQUENTLY TO BE OBSERVED.—INJURIOUS EFFECT OF TARTAR, ARISING FROM GENERAL NEGLIGENCE IN CLEANSING THE TEETH.—TARTAR AND CARIES PREDISPOSE TO OTHER DISEASES.—REMEDIAL AND PREVENTIVE RULES TO BE OBSERVED.

Having pointed out, in the preceding observations, the sure basis on which alone the management of the teeth should be placed, and the natural and true means by which their regularity is chiefly to be expected, it now remains but to consider the measures that are further necessary for adoption, with a view to their preservation and stability. Having avoided the fundamental error of premature extraction, all persons should be impressed with the importance of having their teeth subjected to early and repeated examinations by skilful dentists, and parents and guardians should be careful in attending to this duty in behalf of those committed to their charge. These examinations should be occasionally instituted from nine or ten to twenty years of age, or at earlier or later periods, according to circumstances, in order that any casual tendency to

irregularity may be obviated, any incipient decay arising from accidental causes may be detected and arrested, and any injurious collection of tartar may be removed. Early and repeated examinations by a conscientious practitioner, and attendance to his rules by the patient, will prevent much pain and inconvenience, and thus indirectly be productive of no inconsiderable comfort in after life.

The urgent and indispensable duty of cleanliness must be strongly insisted on, and its importance in preventing any accumulation of tartar, so pernicious in its nature and effects, strongly inculcated. Tartar is a deposit from the saliva of the mouth, in which it has been held in solution. It varies in different individuals, in the extent of its pernicious qualities, according to the constitution, the state of the stomach, and other regulating causes; but it is, inherently, and under the most favourable circumstances, most destructively injurious to the teeth and gums, when allowed to accumulate. Being deposited in a soft and liquid state, it is removable, on its first formation, with the utmost ease; and it must be perfect indifference to cleanliness alone that can allow of its progress towards, and existence in, any state of solidity that will not allow of removal by the simplest means.

It is unquestionable, that the state of the stomach, under various circumstances, does much to influence the formation, and to augment the evil consequences of tartar, which, in its turn, reacts upon that organ; and the injurious effects, not only on the teeth, but on the whole system, through the functions of the stomach, thus increase in a geometrical ratio. It is exceedingly probable, that the whole frame sometimes becomes deranged from this cause alone. In such cases, regardless of the true seat of original disorder (for it is a lamentable fact, that the teeth are, too generally, the very last portions of the human system that receive even passing attention), the patient and medical attendant have recourse to physical means, which procure, perhaps, temporary relief, but which are totally inadequate to cure the disease, most frequently of the digestive organs, under which the patient may labour, whilst this cause still exists.

Caries of the teeth, the frequent result of lateral pressure, of the accumulation of sordes, and of tartar, and of general neglect, will contaminate the secretions poured into the mouth; and the secretions, which have thus become vitiated, will exert an injurious action upon the stomach and the other digestive organs, and, through them, ultimately upon the whole system, thereby

predisposing to many dangerous diseases. The prejudicial influence thus exercised on the digestive organs arises in two ways—*directly*, from the impression made by these secretions upon the mucous surfaces, and by their absorption into the system, and, *indirectly*, by the deprivation of the healthy secretion which is so necessary, in conjunction with the gastric juice, to the processes of digestion and assimilation. On investigating the extent of injury which may accrue from apparently so trivial a cause, it will be found that most of the disorders denominated dyspeptic, various affections of the bowels, and diarrhœa, very frequently derive their origin from this source; and, although it may not excite more dangerous or more acute diseases, yet it not unfrequently predisposes the system to these, especially to the different forms of cholera, and to several infections and febrile maladies.

The extensively evil consequences thus resulting from such an accumulation, should make every one alive to the importance of preventing the deposition of tartar to any extent: and to do this, it is only necessary to have recourse to the daily use of a brush and towel, with a simple powder, composed of equal parts of prepared chalk and pumice stone, with the addition of a small proportion of powdered

nitre.* This simple powder should be used every morning, and at night on retiring to rest; carefully observing, that the brush must pass over the grinding surface, the napkin (over the finger) following on the sides of the teeth and gums. This method of treatment, together with the occasional use of a quill tooth-pick after meals, will supersede the necessity of having recourse to any nostrum in the shape of lotion, &c., which is, generally, to say the least, utterly useless.

The gums, when free from tartar, and in a healthy state, very rarely bleed. The daily use of the above means are then quite sufficient for the removal of this deposition, if it be not of long standing, or have not become consolidated. And it may be observed, that the teeth, however crowded above the gums, are not so at their necks, being parallel with the free edges of the gums. Consequently, if the spaces between them are not kept clean by a tooth-pick or other means, it is impossible to prevent these spaces from becoming filled by accumulation of tartar. Even the daily use of the brush

* Or, Finely prepared chalk ..... 1 ℥
Ditto ditto pumice stone ..... ½ ℥
Armenian bole ..... ¼ ℥
Powdered cuttle fish bone..... ¼ ℥
Powdered nitre ..... ¼ ℥—mix.

will not be alone sufficient to prevent such accumulations taking place, when thus protected between the teeth, and out of the reach of any other means than that of a tooth-pick, &c.

" With the exception of gangrene, there is no kind of injury to which the teeth are exposed, so commonly and so extensively destructive as this concretion (tartar). As it is, generally, first of all deposited at the neck of the teeth, and especially underneath the free edge of the gum, its first effect is to excite more or less irritation in that structure, producing increased redness and sensibility, with sponginess and the separation of its edge from the neck of the teeth. As the accumulation increases, its effects keep pace with it, the gum becomes exceedingly painful, so as to render the ordinary operation of brushing the teeth almost impracticable; and thus, by inducing a neglect of the common means of preventing its accumulation, it becomes the unavoidable cause of its continued increase.

" Absorption of the gum and alveolar processes is the next consequence, which gradually goes on, until the teeth, losing their support, become loosened, and at length fall out. A temporary and fallacious support is sometimes produced by a large quantity of tartar, which forms one continuous mass around the loosened

teeth; and instances have occurred, in which several teeth thus cemented together have come away without being separated from each other.

The inferior incisores, or lower jaw, are more particularly liable to this concretion; and hence it happens, that although these teeth are almost entirely devoid of any tendency to gangrene, and are, consequently, very rarely attacked with that disease, yet there are scarcely any teeth which are so commonly lost as these.

"In cases of great irritability of constitution and want of tone in the system, the irritation which is produced by this cause frequently occasions ulceration of a very unhealthy character in the gums, cheek, or tongue. These ulcers are, in the gums, accompanied with an unnatural fungoid growth, great redness, and a soft spongy texture: they are very difficult to heal, and, in fact, are seldom benefited but by the removal of the irritating substance which had caused them, and free and repeated scarification.

"In addition to this treatment, it is also often necessary to administer alterative remedies combined with, or followed by, tonics, and to apply powerful astringent lotions to the part.

"As this substance is formed from the saliva, whatever cause produces an unhealthy action in the

glands secreting that fluid, will be found invariably to occasion a greater deposition of tartar. Fever, indigestion, or any irregular state of the stomach, drinking, smoking, and similar causes of irritation in the salivary glands, whether local or constitutional, immediate or sympathetic, will produce it. The action of mercury is one of the most speedy and unfailing causes of its accumulation, as it not only induces an increased and unhealthy action in the salivary glands, but, also, by rendering the gums highly susceptible, prevents the necessary precautions from being used, by which the teeth might be kept clean.

"The earthy matter of salivary calculus combines with a considerable quantity of the mucus of the mouth, during its deposition; and, as the same causes which occasion its formation will tend equally to produce an increased and unhealthy secretion of mucus, which, as it is thus rendered viscid, is with more difficulty removed, it often happens that this matter, already offensive, from its diseased condition, becomes excessively fœtid, from putrid decomposition.

"Hence arises that peculiarly disgusting fœtor which almost invariably accompanies the rapid deposition of tartar.

"If, however, the action which occasioned it be

checked, this offensive smell gradually subsides as the calculous deposit becomes consolidated.

"It will be seen, then, from the foregoing statement of the effects of the decomposition of salivary calculus, that not only our comfort and the healthy state of the mouth, but the use and durability of the teeth are materially affected by it; it becomes, therefore, a question of no trifling consequence, in what manner its formation can be obviated, or, at all events, its accumulation prevented? In most cases, a due attention to the state of the stomach, and avoiding, as much as possible, every cause of irritation which I have already spoken of, as the principal source of its secretion, will do much towards preventing the production of tartar in the first instance; though there are some persons whose constitutions are so prone to form calculous deposits in various parts of the body, that no precaution will wholly prevent it. Its accumulation upon the teeth can only be obviated by constant cleanliness, and by carefully removing it as soon as it is deposited, whilst it yet remains in a soft state.

"When the disgusting effects of its accumulation are considered, it would appear impossible that any precaution could be necessary to induce persons to obviate so great a nuisance, even on their own account;

or, if they are too debased to procure their own comfort and cleanliness at the expense of a very little care and trouble, they, surely, have no right to shock the senses of others who possess more delicacy and propriety of feeling than themselves. Yet, so it is; and the sight and the smell are alike constantly outraged by the filthiness of people, who seem to obtrude their faces the closer in proportion to the disgust which they occasion.

"The constant use of a tooth-brush will, in many cases, be sufficient to keep the teeth free from tartar.

"The brush should not be very hard, as it will not only be more difficult to clean the interstices between the teeth,—the part in which the tartar is most likely to be deposited, but, by its friction, will occasion the gradual absorption of the gum, and the exposure of the necks of the teeth. The hair of the brush should be firm and elastic, and not too closely set. The teeth should be thoroughly brushed in every part, at least night and morning, and the mouth always rinsed after each meal. In those constitutions in which there is a particular tendency to form tartar, it will be necessary to have recourse to some simple tooth-powder, such as prepared chalk, or any other substance equally simple and soft: it may, in some cases, be desirable to combine

with it a small proportion of the bone of cuttle fish very finely powdered, and, if the gums are spongy and lax in their texture, a little alum, powdered myrrh, or, bark may be added with advantage. Many of the tooth-powders which are offered for sale, with the promise of rendering the teeth beautifully white, perform, for a time, all that is promised, at the expense of permanent and irremediable injury to the teeth; for they often contain a quantity of tartaric or other acid, which effects a gradual decomposition of the enamel. The use of acids to the teeth cannot be too strongly deprecated. Even when it is necessary to administer acid medicine, it is of considerable consequence that it should be taken through a glass tube, to prevent it from acting upon the enamel of the teeth. For want of this simple precaution, the teeth are very often irremediably injured by the use of this class of remedies."*

In conclusion, the author trusts that his illustrations will suffice to shew the state and progress of the teeth in their natural condition from infancy to maturity. It is their preservation in this natural and healthy condition that he wishes to ensure, and in the obtain-

* T. Bell.

ing of which he ventures to affirm that there will not be one case of toothach, or loss of teeth, for thousands that now take place. His object, in the brief observations made in these chapters, has been to point out that the main source of irregularity and decay is to be found in premature extraction or loss of the temporary teeth; and that, by the avoidance of such extraction or loss, those more immediate bad consequences, with the lamentable train of ulterior evils springing from them, may be easily spared.

THE END.

LONDON:

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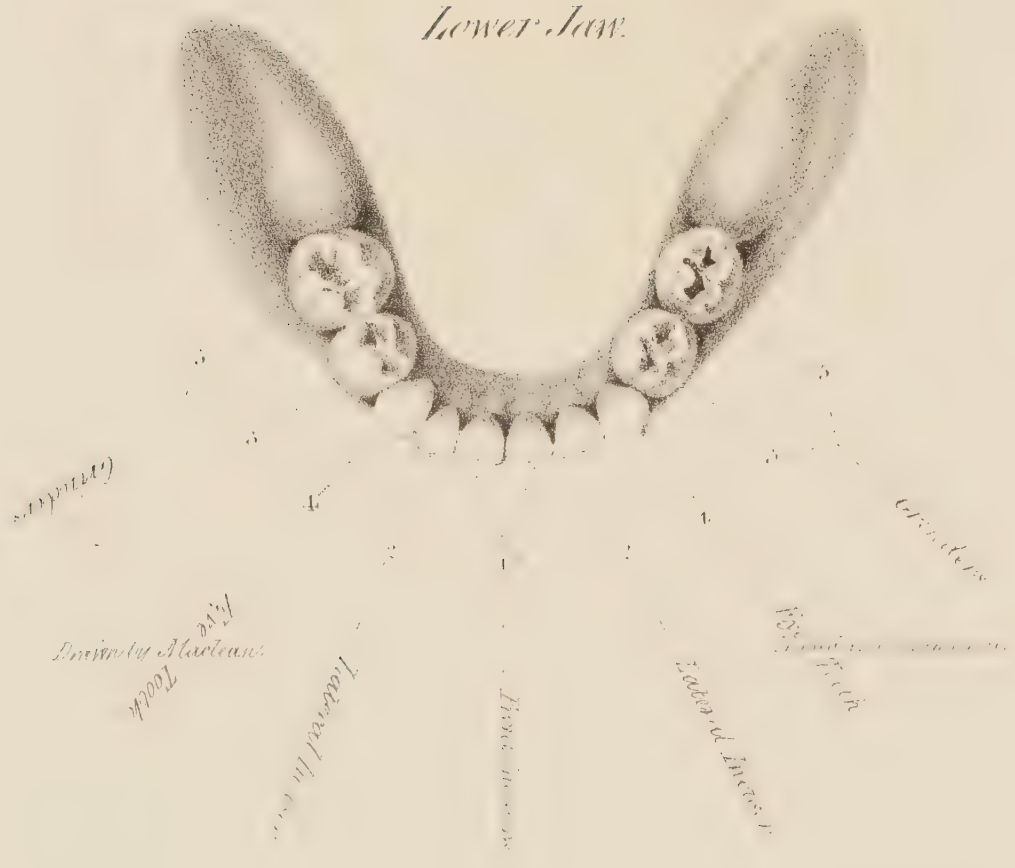
TEMPORARY TEETH.

Plate I.

Upper Jaw.

Lower Jaw.



REFERENCE TO PLATE I.

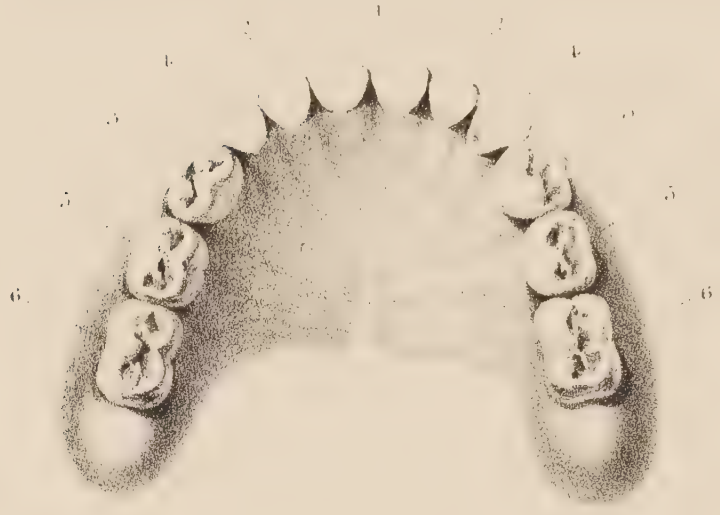
Shewing the Upper and Lower Jaws of a Child, from three to six years of age, and exhibiting the whole of the temporary teeth, consisting of ten in each jaw. They usually cut the gums in the following order; and are classed as follows, 4 incisores, 2 eye teeth, and 4 grinders, in each jaw, those of the lower taking precedence, by two or three months, of the teeth of the upper jaw.

Fig. 1. The two central Incisores cut the gums from 3 to 6 months.
2. The two lateral Incisores - - - from 5 to 9 months.
3. The two first Molares or Grinders from 8 to 15 months.
4. The two Canini or Eye-teeth - - from 15 to 18 months.
5. The two second Molares or Grinders at from 18 months to 3 years — as annexed, constituting the "first era in teething" of Mr. Paterson Clark.

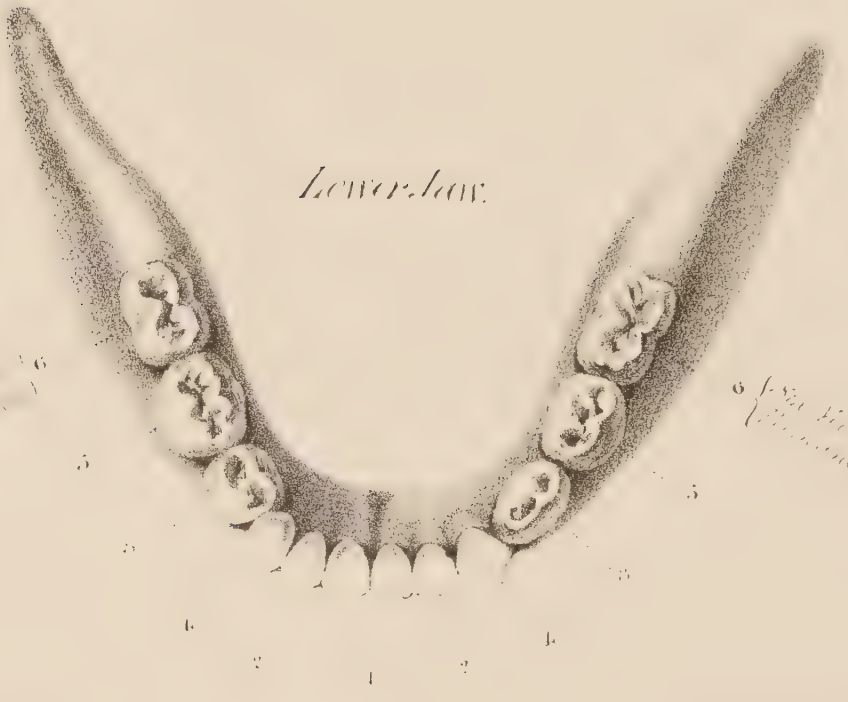
PERMANENT & TEMPORARY TEETH.

Plate II.

Upper Jaw.



Lower Jaw.



REFERENCE TO PLATE II.

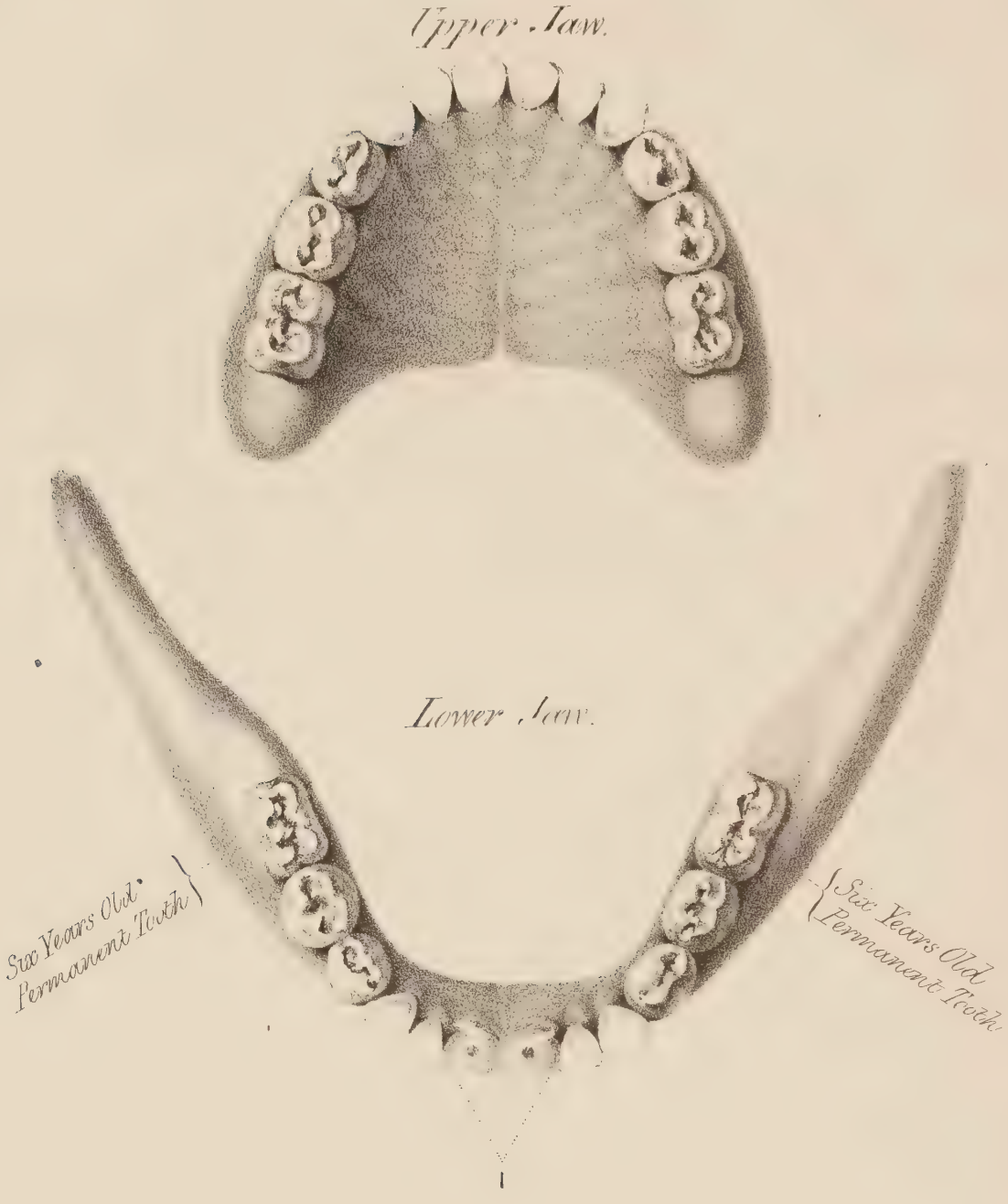
Representations of the Upper and Lower Jaws of a Child, from six to seven years of age, still containing the whole of the temporary teeth; with the addition at this period of the first permanent molares, or grinders, viz.

Fig. 1. The two central Incisores cut the gums from 4 to 7 months.
2. The two lateral Incisores - - - from 6 to 9 months.
3. The two first Molares or Grinders - from 9 to 16 months.
4. The two Canini or Eye-teeth - - from 16 to 18 months.
5. The two second Molares or Grinders from 18 to 36 months.
*6. The two first permanent Molares or Grinders from 6 to 7 years—commencing the "*second era* in teething," each comprising intervals of six years.

* Particular attention is directed to the first permanent teeth, which are the "six year old" molares or grinders. From their early appearance, they are frequently overlooked or mistaken for shedding ones, and are therefore allowed to run into decay. "They are the sixth on each side from the centre of the mouth in each jaw."

PERMANENT & TEMPORARY TEETH.

Plate III.



REFERENCE TO PLATE III.

Representations of the Upper and Lower Jaws, from six years and a half to eight years of age.

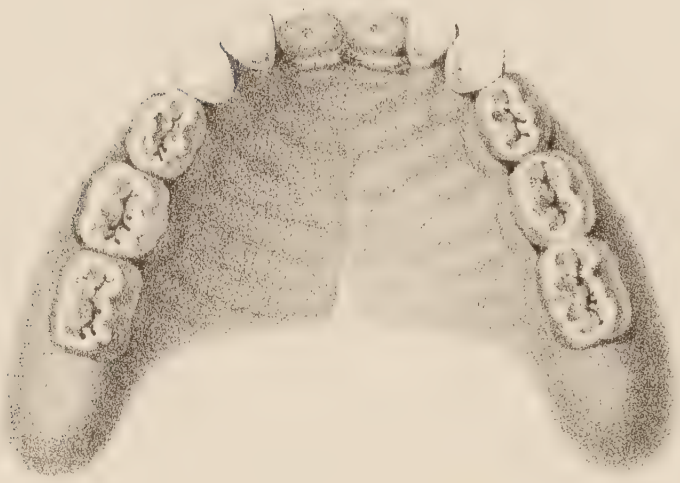
At this period, the change commences in the shedding teeth, those of the lower jaw preceding the upper ones: this change first begins with the loss of the two central temporary incisores, or front teeth, which have just dropped out, (see vacancy Fig. 1 in the lower jaw.)

PERMANENT & TEMPORARY TEETH.

Plate IV.

Upper Jaw.

1



Lower Jaw.

2 2

1

Drawn by Maclean.

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REFERENCE TO PLATE IV.

Representations of the Upper and Lower Jaws, from seven to eight and a half years of age.

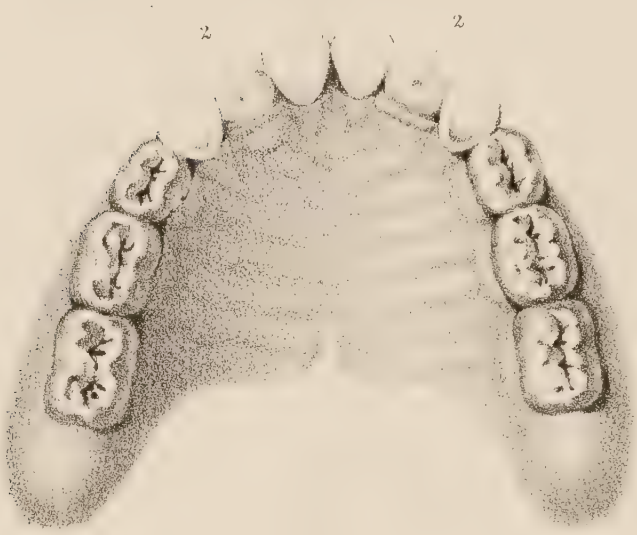
At this period, the two temporary central incisores, or front teeth in the upper jaw have dropped out, (see vacancy Fig. 1.)

In the lower jaw the two permanent central incisores have appeared, (see Fig. 1) followed by the loss of the two lateral temporary incisores, (see vacancies Fig. 2 and 2.)

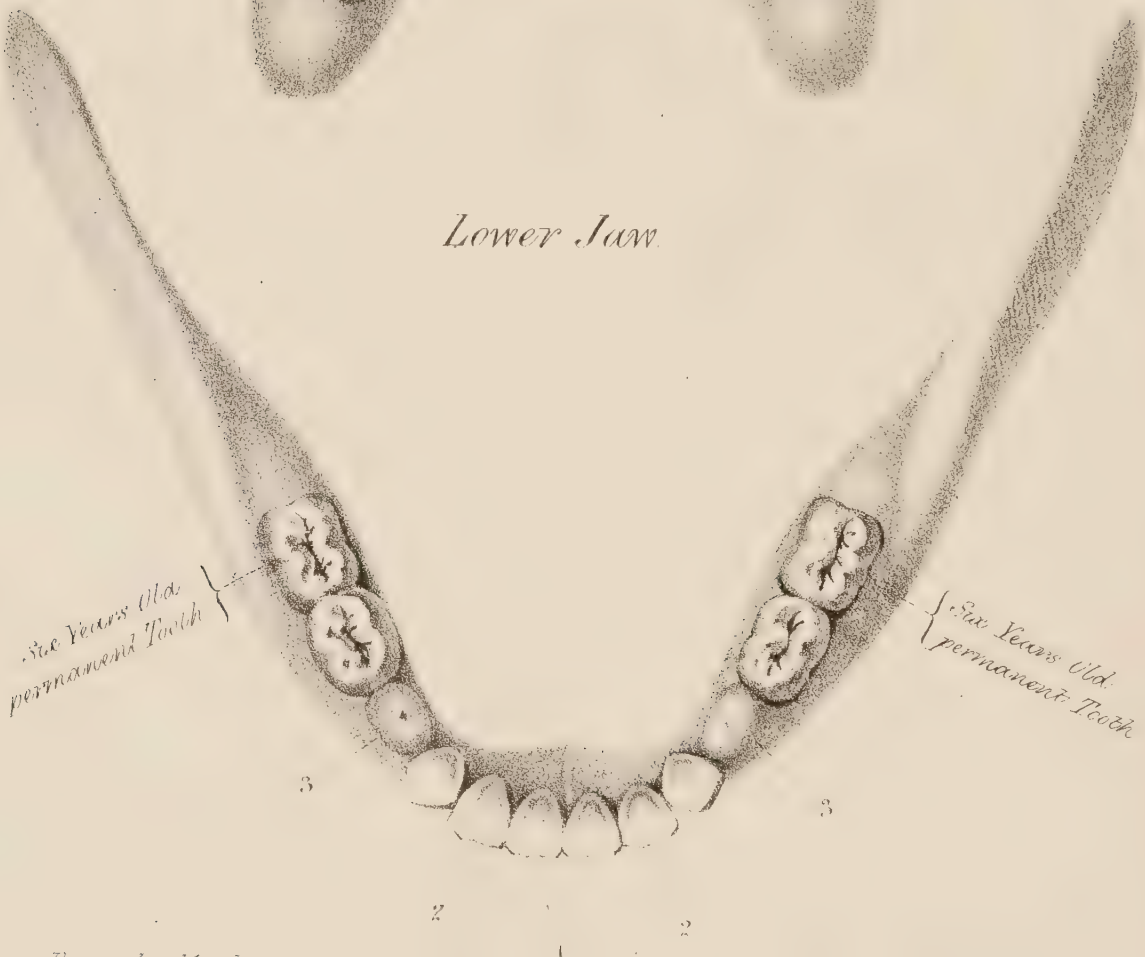
TEMPORARY & PERMANENT TEETH.

Plate V.

Upper Jaw.



Lower Jaw.



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REFERENCE TO PLATE V.

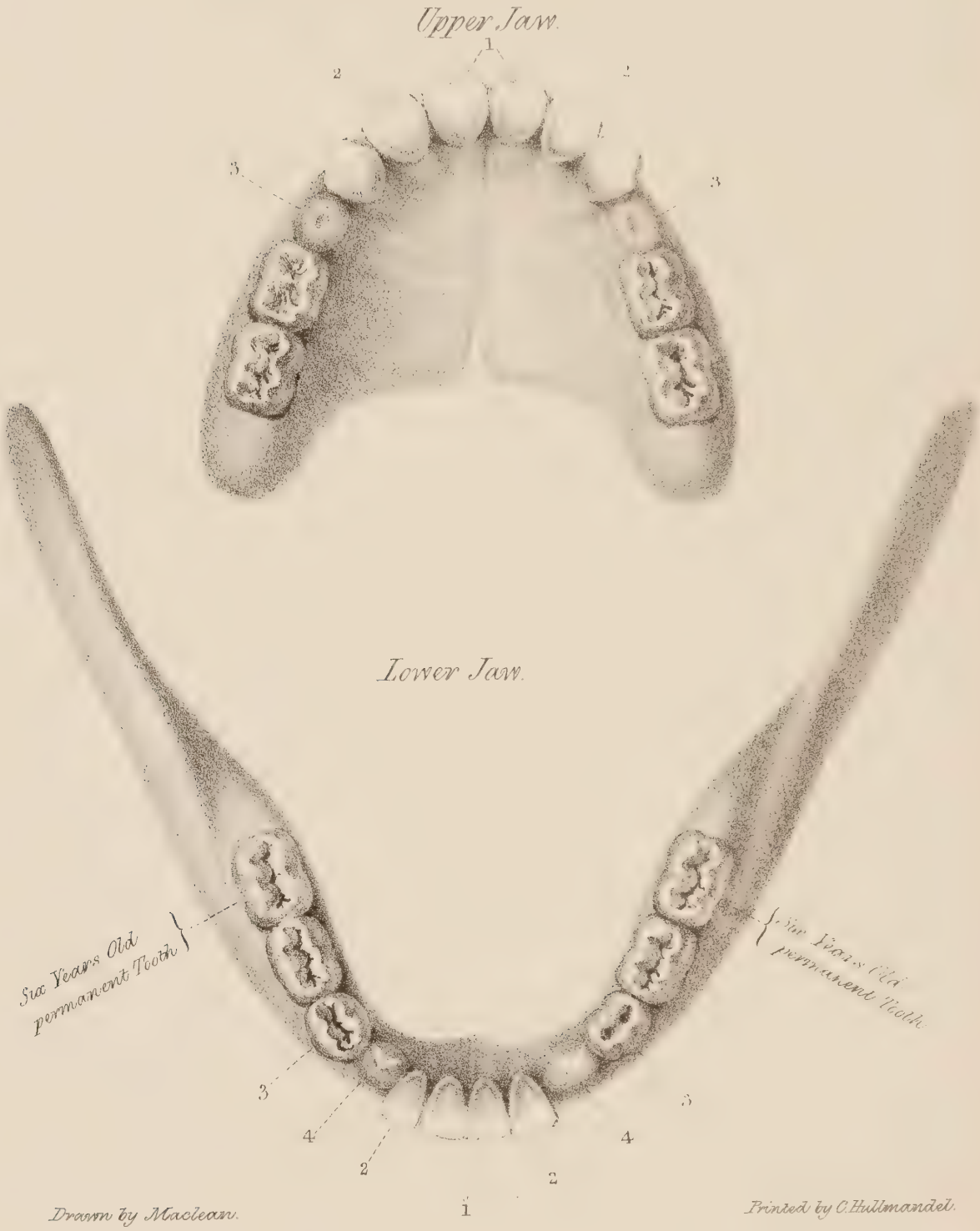
Representations of the Upper and Lower Jaws, from eight to nine years of age.

At this period, the two central permanent incisores (see Fig. 1) have made their appearance in the upper jaw, where the loss of the two temporary lateral incisores is also represented as at vacancies Nos. 2 and 2.

In the under jaw, the two central and two lateral permanent incisores are completed as at Nos. 1 and 2; followed by the loss of the two first temporary molares or grinders, (see vacancies Nos. 3 and 3.)

PERMANENT & TEMPORARY TEETH.

Plate VI



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REFERENCE TO PLATE VI.

Representations of the Upper and Lower Jaws, from eight and a half to nine and a half years of age.

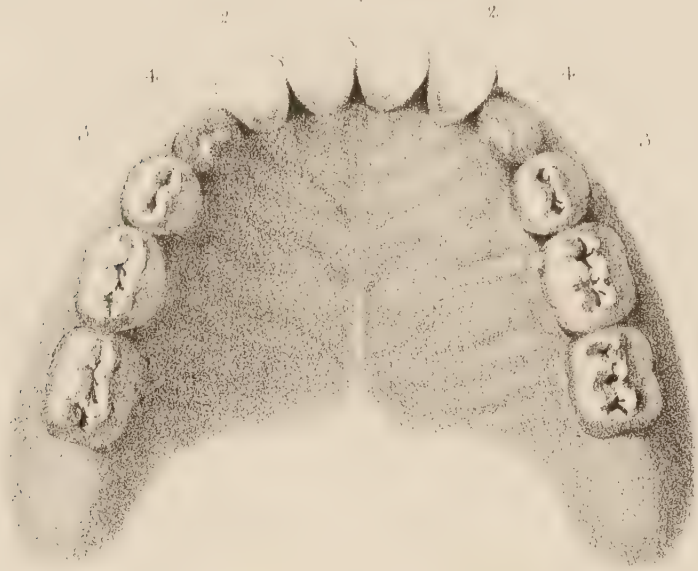
At this period, the four front teeth or permanent incisores are completed in the upper jaw, (see Fig 1. and 2) followed by the loss of the first temporary molares or grinders, (see vacancies Fig. 3. and 3.)

In the under jaw, in addition to the four front permanent incisores, (see Fig. 1 and 2,) the two first bicuspides, or small permanent grinders have appeared, (see Fig. 3 and 3,) followed by the loss of the two canine or eye teeth, (see vacancy Fig. 4 and 4.)

PERMANENT & TEMPORARY TEETH.

Plate VII.

Upper Jaw.



Lower Jaw.

Drawn by Maclean.

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REFERENCE TO PLATE VII.

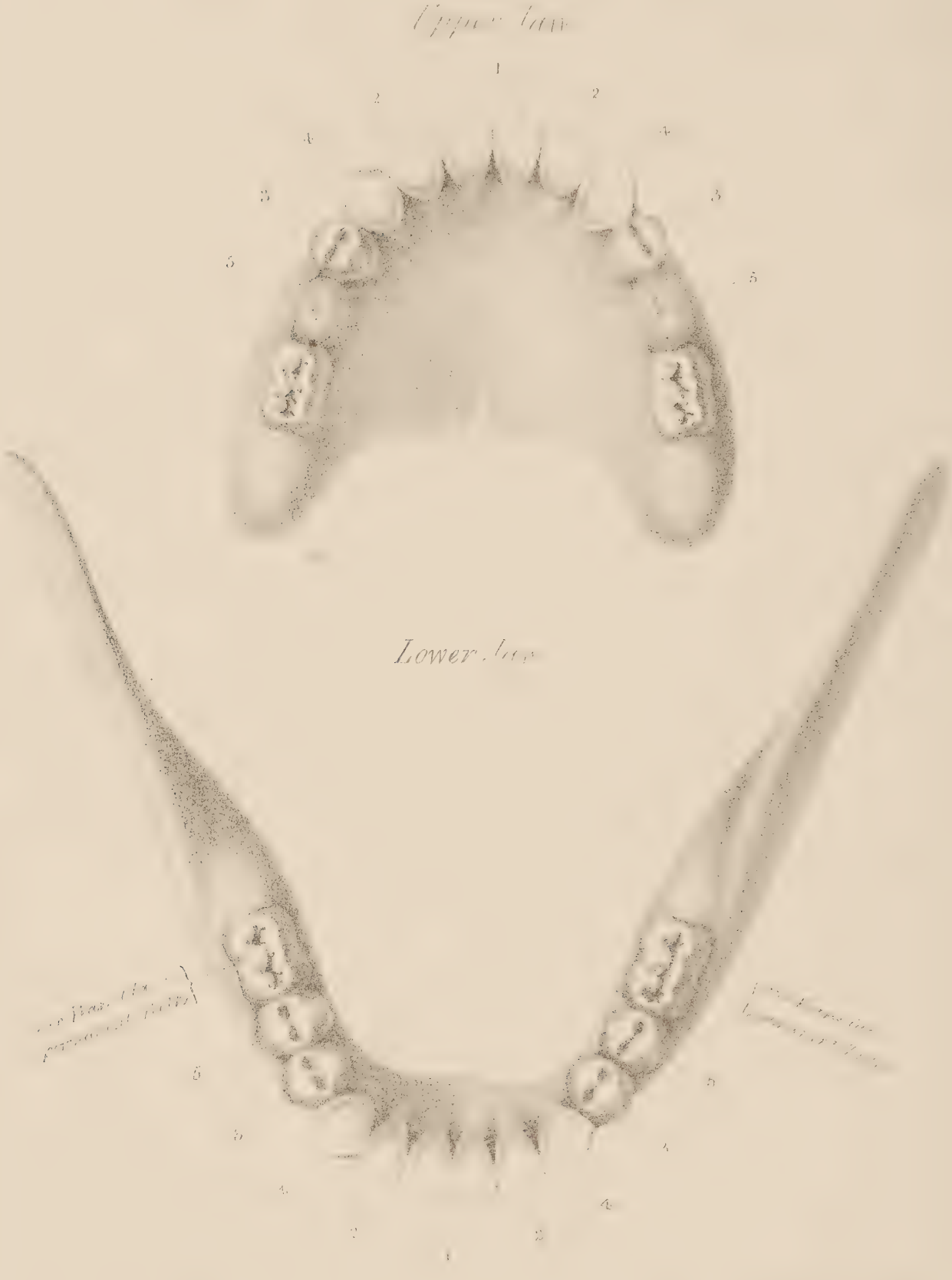
Representations of the Upper and Lower Jaws, from nine to ten years of age.

At this period, the two central, and the two lateral permanent incisores, with the two bicuspides, or small permanent molares, are completed in the upper jaw, (see Fig. 1, 2 and 3,) followed by the loss of the two temporary canine or eye teeth, (see vacancies Fig. 4 and 4.)

In the under jaw, the two central, and two lateral permanent incisores, the two bicuspides or small permanent molares, with the two canine or permanent eye teeth, are all completed, (see Fig. 1, 2, 4 and 3,) followed by the loss of the two last or second temporary molares, (see vacancies Fig. 5 and 5.)

PERMANENT & TEMPORARY TEETH.

Plate VIII.



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REFERENCE TO PLATE VIII.

Representations of the Upper and Lower Jaws, from ten to twelve years of age.

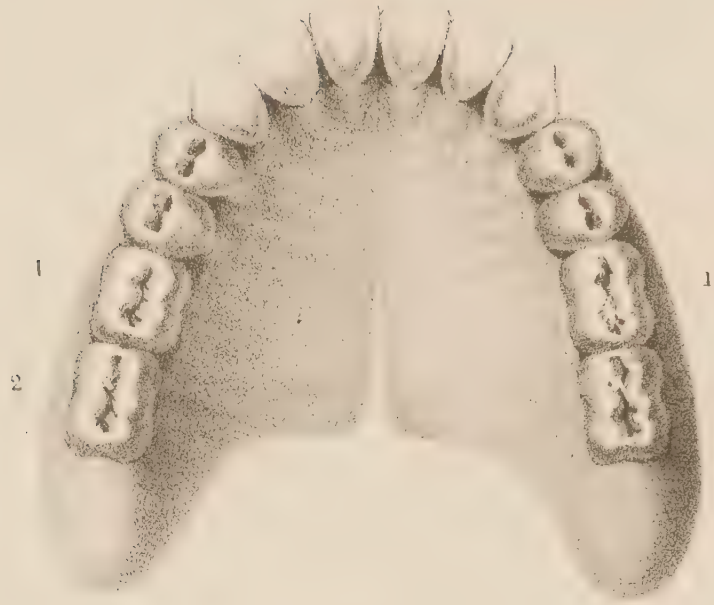
At this period, the two central, and the two lateral permanent incisores, the two first permanent bicuspides, or small grinders, together with the two permanent canine or eye teeth, are all completed, in the upper jaw, (see Fig. 1, 2, 4 and 3,) followed by the loss of the last or second temporary molares, or grinders, (see vacancies Fig. 5 and 5.)

In the lower jaw appear the two central and the two lateral incisores, the two first bicuspides or small grinders, the two canine or eye teeth, and the two second bicuspides or small grinders, (see Fig. 1, 2, 4, 3 and 5,) which complete the permanent teeth at this age in the under jaw.

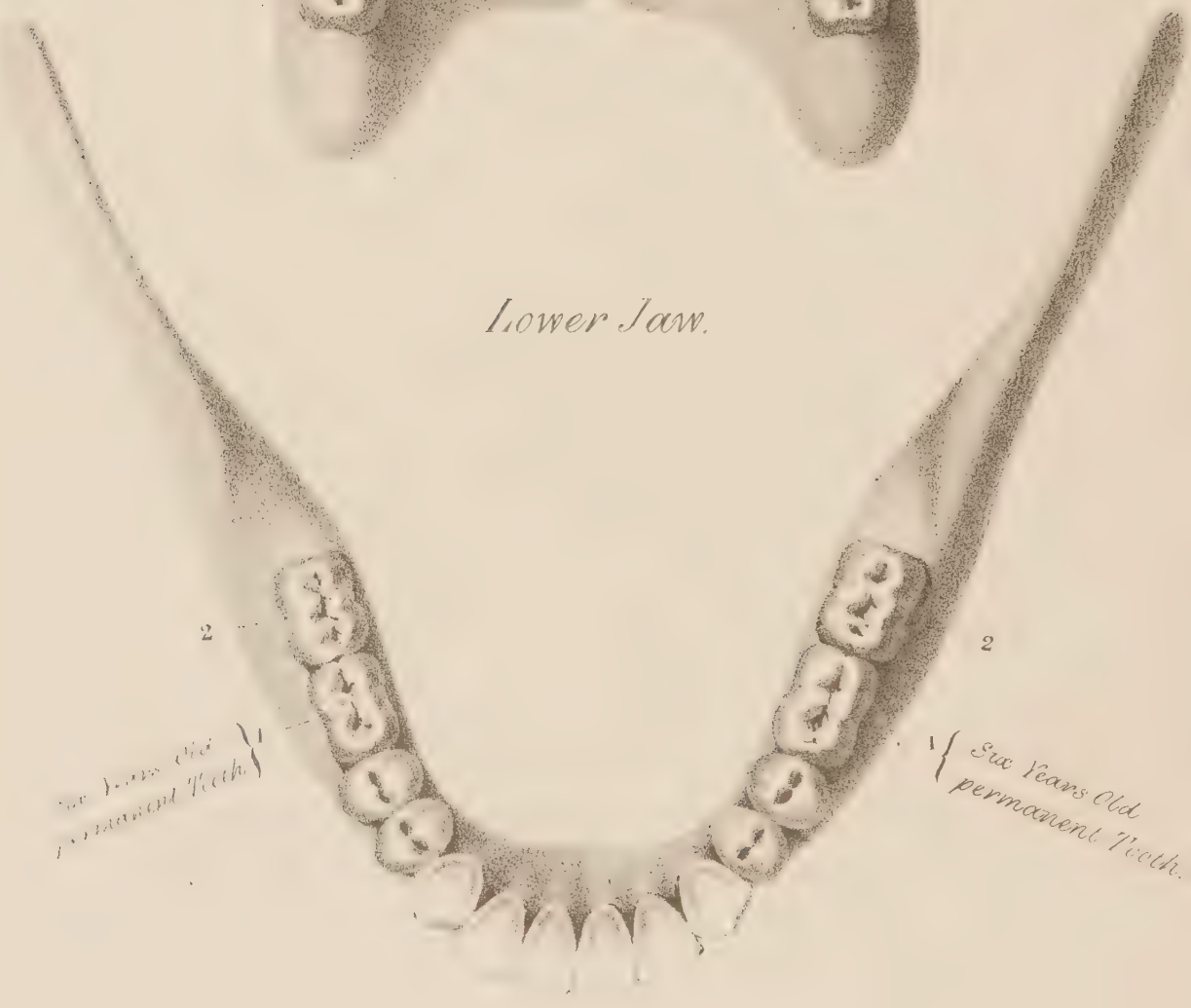
PERMANENT TEETH.

Plate IX.

Upper Jaw.



Lower Jaw.



REFERENCE TO PLATE IX.

Representations of the Upper and Lower Jaws, from twelve to fourteen years of age.

At this period, the whole of the temporary teeth are shed in both jaws, and are succeeded by the permanent, ending with the second bicuspides or small grinders.

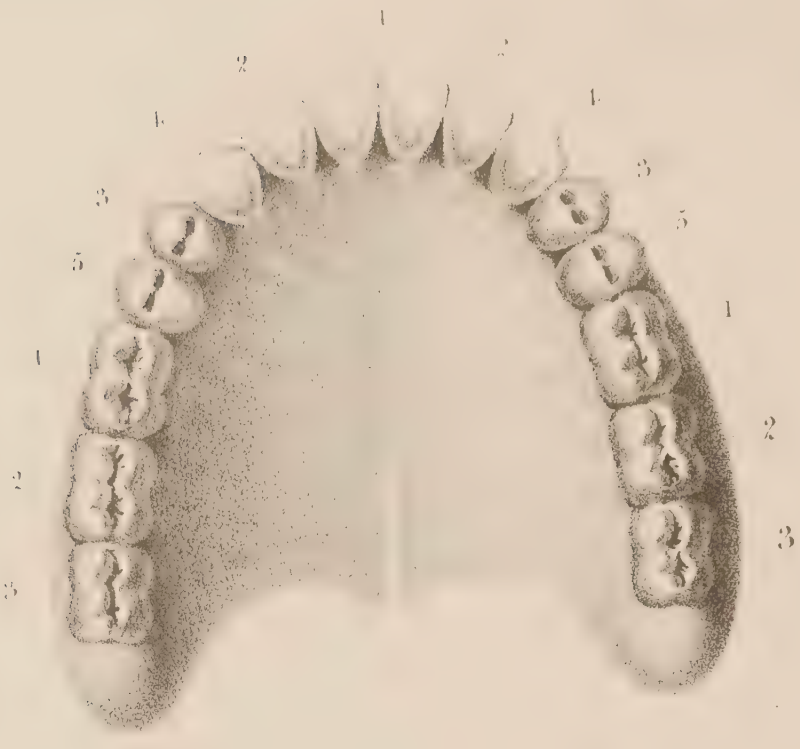
At this period, especially, the attention of parents and guardians of youth should be particularly directed to the state of the first permanent molares or grinders, or the six year old teeth, (see Fig. 1.) which existed in the jaws during, and previous to the shedding of the temporary teeth, and which are, consequently, generally mistaken for temporary teeth; thus they become subject to decay, and are liable to be lost; whilst, by early attention, with the knowledge that they are permanent, and are intended for life, they are easily preserved.

Other teeth now appear posterior to them, viz.—the second molares or grinders, (see Fig. 2.) the anterior teeth being described as they appear in the preceding illustrations, they are not here repeated. These are the seventh on each side from the centre of the mouth. This is the "third era in teething."

PERMANENT TEETH.

Plate X.

Upper Jaw.



Lower Jaw.

Drawn by Maclean.

Printed by C. Hullmandel.

REFERENCE TO PLATE X.

Representations of the Upper and Lower Jaws, from fourteen to seventeen, and till twenty-five years of age.

At this period, the whole of the permanent teeth are completed, amounting to sixteen in each jaw. They appear in the following order, viz.—the two central incisores, the two lateral incisores, the two first bicuspides, or small grinders; the two canine, or eye teeth; the two second bicuspides, or small grinders. These complete the successors to the temporary teeth, (see Fig. 1, 2, 4, 3, and 5.). Posterior to these are the first molares, or large grinders, (received at six years of age,) then, the second molares, or large grinders; followed by the third molares, or dentes sapientes, or wisdom teeth, (see Fig. 1, 2 and 3), or the sixth, seventh and eighth from the centre of the mouth, completing the last or "fourth era of teething."

London, April 1836.

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